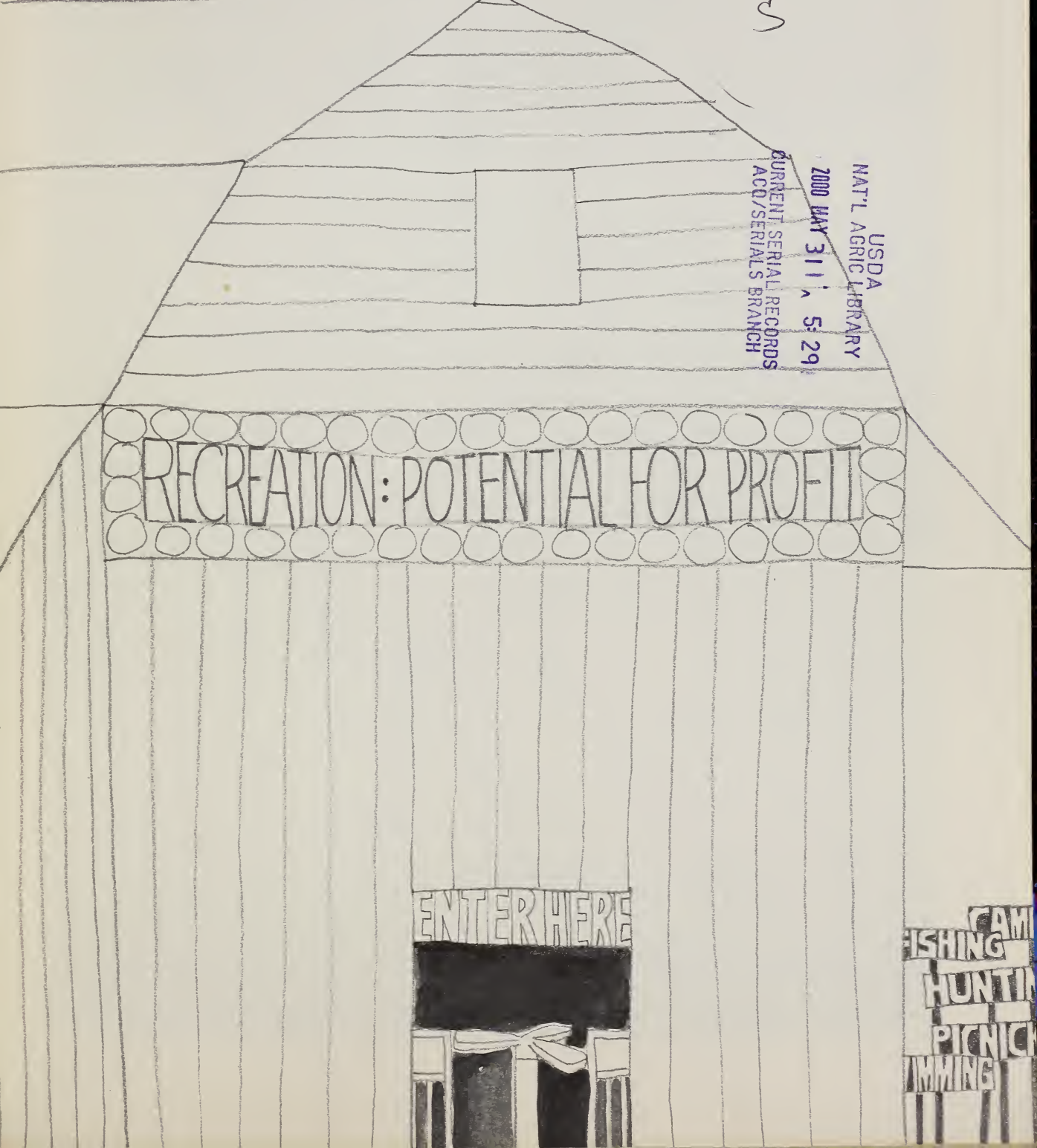
THE FARM INDEX

ECONOMIC RESEARCH SERVICE ★ U.S. DEPARTMENT OF AGRICULTURE ★ MAY 1967



ECONOMIC TRENDS

ITEM	UNIT OR BASE PERIOD	'57-'59 AVERAGE	1966		1967		
			YEAR	MARCH	JANUARY	FEBRUARY	MARCH
Prices:							
Prices received by farmers	1910-14=100	242	265	269	255	252	250
Crops	1910-14=100	223	235	231	224	223	224
Livestock and products	1910-14=100	258	292	303	281	277	273
Prices paid, interest, taxes and wage rates	1910-14=100	293	334	331	340	339	340
Family living items	1910-14=100	286	315	313	318	318	319
Production items	1910-14=100	262	285	284	289	288	289
Parity ratio		83	80	81	75	74	74
Wholesale prices, all commodities	1957-59=100	—	105.9	105.4	106.2	106.0	106.0
Industrial commodities	1957-59=100	—	104.7	104.0	105.8	105.8	106.2
Farm products	1957-59=100	—	105.6	106.8	102.6	101.0	100.7
Processed foods and feeds	1957-59=100	—	113.0	112.2	112.8	111.7	110.9
Consumer price index, all items	1957-59=100	—	113.1	112.0	114.7	114.8	—
Food	1957-59=100	—	114.2	113.9	114.7	114.2	—
Farm Food Market Basket: [1]							
Retail cost	Dollars	983	1,100	1,103	1,091	1,083	—
Farm value	Dollars	388	442	461	418	413	—
Farm-retail spread	Dollars	595	658	642	673	670	—
Farmers' share of retail cost	Per cent	39	40	42	38	38	—
Farm Income:							
Volume of farm marketings	1957-59=100	—	120	94	126	93	97
Cash receipts from farm marketings	Million dollars	32,247	42,879	2,990	3,637	2,705	2,800
Crops	Million dollars	13,766	18,213	845	1,578	891	800
Livestock and products	Million dollars	18,481	24,666	2,145	2,059	1,814	2,000
Realized gross income	Billion dollars	—	49.5	48.4	—	—	50.0
Farm production expenses	Billion dollars	—	33.2	31.9	—	—	34.8
Realized net income	Billion dollars	—	16.3	16.5	—	—	15.2
Agricultural Trade:							
Agricultural exports	Million dollars	4,105	6,885 [3]	625	532	514	—
Agricultural imports	Million dollars	3,977	4,492 [3]	431	413	354	—
Land Values:							
Average value per acre	1957-59=100	—	150 [4]	—	157 [5]	—	—
Total value of farm real estate	Billion dollars	—	171.1 [4]	—	179.7 [5]	—	—
Gross National Product: [2]	Billion dollars	457.3	739.6	721.2	—	—	764.3
Consumption [2]	Billion dollars	294.2	464.9	455.6	—	—	482.2
Investment [2]	Billion dollars	68.0	117.0	114.5	—	—	109.0
Government expenditures [2]	Billion dollars	92.4	153.0	145.0	—	—	168.2
Net exports [2]	Billion dollars	2.7	4.8	6.0	—	—	4.9
Income and Spending: [6]							
Personal income, annual rate	Billion dollars	365.3	580.4	569.0	607.5	609.7	613.1
Total retail sales, monthly rate	Million dollars	17,098	25,306	25,536	25,687	25,636	26,474
Retail sales of food group, monthly rate	Million dollars	4,160	5,927	5,917	5,911	5,970	—
Employment and Wages: [6]							
Total civilian employment [7]	Millions	63.9	72.9	72.3	74.3	74.1	73.7
Agricultural [7]	Millions	5.7	4.0	4.1	4.0	3.9	3.9
Rate of unemployment [7]	Per cent	5.8	3.8	3.8	3.7	3.7	3.6
Workweek in manufacturing	Hours	39.8	41.3	41.5	41.0	40.3	40.4
Hourly earnings in manufacturing, unadjusted	Dollars	2.12	2.71	2.68	2.78	2.78	2.79
Industrial Production: [6]	1957-59=100	—	156	154	158	156	156
Manufacturers' Shipments and Inventories: [6]							
Total shipments, monthly rate	Million dollars	28,745	44,037	44,121	44,460	43,935	—
Total inventories, book value end of month	Million dollars	51,549	77,897	69,648	78,886	79,297	—
Total new orders, monthly rate	Million dollars	28,365	45,182	45,833	43,408	43,436	—

[1] Average annual quantities of farm food products purchased by urban wage-earner and clerical-worker households (including those of single workers living alone) in 1960-61—estimated monthly. [2] Annual rates seasonally adjusted first quarter. [3] Preliminary. [4] As of March 1, 1966. [5] As of November 1, 1966. [6] Seasonally adjusted. [7] Series revised beginning January 1967, giving data for persons 16 years of age and older.

Sources: U.S. Dept. of Agriculture (Farm Income Situation, Marketing and Transportation Situation, Agricultural Prices, Foreign Agricultural Trade and Farm Real Estate Market Developments); U.S. Dept. of Commerce (Current Industrial Reports, Business News Reports, Advance Retail Sales Report and Survey of Current Business); and U.S. Dept. of Labor (The Labor Force and Wholesale Price Index).

THE AGRICULTURAL OUTLOOK

Prospects for farm prices and incomes are unusually sensitive this spring. Without large carryover stocks of grain, grain prices are more responsive to factors affecting supply and demand than for many years. Prices of livestock and products also reflect these forces.

Last year, livestock producers responded to relatively favorable prices and incomes by stepping up production. They increased feeding rates, pig crops, and output of poultry and eggs. As a result, livestock production rates by the first quarter this year were in general well above a year earlier. Even with the continued expansion in demand, livestock product prices in January-March averaged about 8 per cent below both a year earlier and the late summer highs.

Crop prices in the first quarter averaged 8½ per cent below the summer high last July, and about 2½ per cent below a year earlier.

Soybean producers are planning to seed a record soybean acreage for the seventh consecutive year. They report intentions to plant 40.6 million acres this year. If yields are average, allowing for trend, the crop would be around 7 per cent larger than last year's record 931 million bushels —and would reach the billion-bushel mark for the first time. Acreage expansion of 9 per cent over 1966 reflects the ever-growing world demand for protein and fats and oils.

WHAT'S WHAT AMONG EDIBLE VEGETABLE OILS?

In the past 10 years there have been big increases in most all edible vegetable oils.

As a result, vegetable oils (excluding the palm family) are expected to account for 18.4 million of an estimated 32.6 million short tons of 1967 world production of all food fats and oils.

The estimated 1967 global output is 29 per cent higher than in 1957. But it is still low when one considers that world population has advanced 20 per cent. The net result:

Production of edible fats and oils for the world as a whole has edged up, but only to 19 pounds per person from 18 pounds a decade ago. (Per capita consumption in the United States is around 48 pounds.)

Increasing emphasis on vegetable oils as food warrants a closer look at some specific crops and the oil they yield:

Soybean oil is the volume leader in world edible vegetable oil output and trade.

Production has soared a dramatic 80 per cent between 1957 and 1967 to reach 5.4 million tons.

The U. S. is by far the largest producer of both oil and meal, as well as beans for crushing abroad. We grow about three-fourths of the world's soybean supplies and account for about 90 per cent of world exports of soybeans and soybean products.

U. S. acreage of 55 to 65 million is in prospect for 1980 if the uptrend in planting simply continues at the same pace it has for the past seven years.

Domestic use of soybean oil is setting a new record this year, but exports have been off sharply in the early part of this marketing year.

Prices of soybean oil are running below those of 1966, when crude oil was bringing an average of 11.7 cents a pound at Midwestern mills. In February of this year the price slid to 10 cents, then strengthened slightly in March, and is now expected to remain firm or possibly increase along with a pickup in exports and a reduction in competing supplies of cottonseed oil and meal.

This year's slippage in soybean oil prices is attributed to increased world availabilities of almost all vegetable oils—the result of generally larger 1966 oilseed harvests. Cottonseed was the major exception.

On a global basis, per capita consumption of soybean oil has increased significantly in the past few years, with almost all of the gain occurring in the salad, cooking, and other edible oil categories.

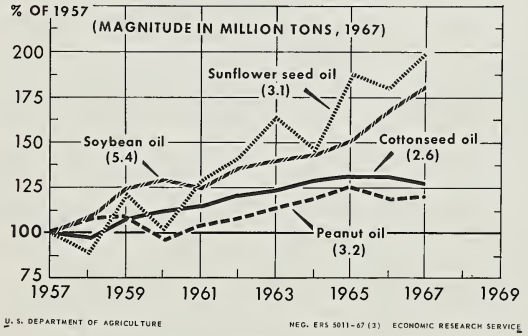
Mainland China ranks next to the U. S. as a soybean producer, but its output is expected to remain static at around the 250-million-bushel level of recent years.

In Japan, soybean acreage will probably continue downtrending because of increasing population pressure on arable land.

Thus, Brazil now appears to be the only country outside the U. S. likely to augment world supplies to any extent.

Peanut oil, second largest in world volume of edible vegetable oils, has gained only 20 per cent in the past decade.

WORLD PRODUCTION OF LEADING EDIBLE VEGETABLE OILS



Increases in India and West Africa have been partly offset by a downtrend in Mainland China. Nigeria and Senegal account for about 60 per cent of world exports of peanuts and oil.

Sunflower seed oil, rather surprisingly, has rocketed into third place (3.1 million tons) on the edible oil production ladder. Large supplies of Russian seed and oil are having an impact on world food oil marketings of recent months (see page 19).

Cottonseed oil output on a worldwide basis rose 30 per cent between 1957 and 1965, but has since fallen off to about 2.6 million tons—largely because of the sharp cutback in U. S. cotton acreage and production.

On the basis of growers' March 1 intentions, U. S. cotton plantings of 10.0 million acres will be the smallest since the 1870's, though only slightly less than the low level of 1966.

So much for the top four food oils of the vegetable kingdom. As for some of the others:

Olive oil shows no pronounced trend, as production traditionally shows wide fluctuations.

Rapeseed oil output, after remaining stable for some years, climbed sharply in 1965 and has been relatively high since. Sizable gains have been registered in Canada, Poland, East Germany, France and India—largest producer.

Sesame seed oil can be expected to stay around the rather steady, though unofficial, 600,000-ton mark of the past 10 years. This oilseed requires highly intensive labor because of its shattering characteristics.

Safflower seed oil and **corn oil** might reach a volume of nearly 300,000 tons each in 1967.

Both have made spectacular gains since 1957. Safflower seed oil output has more than tripled, and that of corn oil is up 67 per cent. The U. S. is the largest producer of both.

Further gains in production of corn oil and safflower seed oil are in prospect.

Improved varieties of safflower seed, already introduced, will probably encourage bigger plantings, especially in the U. S. and Mexico. These two countries are the largest exporters, with Japan the major customer. India is a big producer of safflower seed, but most of the crop is used to meet domestic demand.

TOBACCO EXPORT PICTURE BRIGHT

Third largest exports on record are in sight for U. S. growers of flue-cured tobacco.

For the year ending June 30, 1967, shipments abroad of flue-cured are likely to range between 525 and 545 million pounds (farm sales weight). This would exceed 1965/66 exports by over 100 million pounds and be the biggest export volume in over a decade. Main factors behind the surge in flue-cured exports are the sanctions against competing Rhodesian tobacco, the improved quality of our past two crops, and the export payment program.

COTTON UNLIMITED

With no ceiling on acreage, cotton production might soar to 38 million bales—or plummet to almost nothing. The big question of whether to plant would then depend only on vicissitudes of price.

Take the ceiling off cotton acreage and what would happen?

The somewhat roundabout and oversimplified answer: It depends on the price of cotton and the other crops that might compete for land on the farm.

At top prices of, say, 30 cents a pound, just about every last acre of suitable farmland would be planted to cotton and production would soar to around 38 million bales of cotton a year.

With prices at the bottom of the scale farmers would—if they could—get out of cotton in a hurry.

These are, of course, estimated responses produced by mathematical linear programming. They come from a study of economic opportunities for southern farming. It is a joint project of the Economic Research Service and Agricultural Experiment Stations in 17 states. The study areas in the 17 states account for four out of every five bales of cotton produced in the United States.

If output responses for all cotton producing areas matched those of the 17 study areas, estimated production of cotton for the nation would be 1.9 million bales at a price of 15 cents a pound.

By raising the price of cotton 5 cents—to 20 cents a pound—the response, in terms of production, would jump 10.1 million bales to 12.0 million for the nation.

For each cent increase above 20 cents, up to 25 cents a pound, total cotton production would rise from 18.6 million bales to 21.7 million, to 24.0 million, to 29.1 million, and finally to 31.9 million bales at 25 cents.

To put it another way, production increases by close to 20 million bales as the price is raised from 20 to 25 cents a pound.

At 30 cents a pound, the production response would amount to 37.8 million bales, an increase of only about 6 million bales for the five cent increase in price.

And at 35 cents a pound, production climbs by less than 1 million bales of cotton.

Thus, the output of cotton responds to a greater degree to changes in the price of cotton between 20 and 25 cents per pound than to changes above or below these levels.

The large increase in the production of cotton between 15 and 25 cents indicates that at these prices cotton is more profitable than most crops that compete for production resources.

As the price of cotton is increased from 15 cents, cotton replaces feed grains, generally less profitable than other alternative crops. When the price of cotton

is pushed from 25 to 30 cents a pound, cotton becomes more profitable than soybeans and wheat, replacing them in production.

At 30 cents a pound, essentially all the suitable land is in cotton. Thus, there is little change in the output between 30 and 35 cents a pound.

Some of the assumptions on which the figures are based were: There were no acreage allotments for cotton, rice, tobacco, peanuts or wheat—the alternative crops studied. Production in all regions studied responded to price changes by moving toward the most profitable enterprises. All costs, except for general overhead, land, operator labor and management costs were considered to be variable. Also, the farms were assumed to be run at the most efficient levels now current.

Some of the key prices used for alternative commodities were: shelled corn, $1.10 a bushel; grain sorghum, $1.77 a hundredweight; wheat, $1.25 a bushel; soybeans, $2.00 a bushel; beef cattle, $17.00 a hundredweight; and hogs, $14.50 a hundredweight. (*1*)

3,212 Is a Lot of Birds

Egg farms in the South Atlantic, South Central and Western states more than doubled in size between 1959 and 1964. Arkansas, Florida and California reported three to fourfold gains in birds per farm.

Average size of a flock was largest in California (3,212 birds) and also large in most North Atlantic States (1,500 to 2,000 birds).

Part of the increase in average size of farms stemmed from a rapid exodus of small farm flocks from the egg and poultry business between 1959 and 1964.

In 1964 some 527,000 farms reported egg sales—only half as many as in 1959. The number of turkey farms was also cut in half, down to 42,000. But farms reporting broiler production stayed nearly the same—down only 6,600 over the five-year period. (*2*)

Expenditures for Pest Control Rise On U.S. Farms in Last Ten Years

Insects, diseases, weeds and other agricultural pests cost U.S. farmers billions of dollars each year. To attempt to control these pests, farmers doubled their expenditures for pesticides between 1954 and 1964.

ERS economists recently completed the first nationwide survey of pesticide expenditures by those farms that annually produce about 90 per cent of our total agricultural output. These are the farms in the gross sales category of $5,000-plus ($2,500-plus in the 12 southern states). Here are some of the survey highlights:

—Ninety-four per cent of the farmers surveyed used some type of pesticides in 1964. Nearly three-fourths reported applying pesticides to crops; three-fifths used them for treating livestock and poultry; about half used pesticides for treating noncropland and for rodent control.

—Total purchases of pesticides for farm use (excluding pesticides used for seed treatment or stored crops) amounted to about $456 million in 1964 for all farms represented by the survey. This was equal to about 2 per cent of total farm production expenses.

—Eighty-five per cent of total expenditures were on crop pesticides, 11 per cent on livestock pesticides and only 4 per cent for other types. Even on specialized dairy and livestock farms, expenditures for crop pesticides were about twice as high as those for livestock.

—Farmers in the Corn Belt were the No. 1 purchasers of pesticides in 1964, spending about $87 million and accounting for about 19 per cent of all pesticides used. The Pacific States ranked second, with pesticide expenditures of $62 million; the Delta States were third in the nation with $55 million.

—Cotton farms used more pesticides in 1964 than any other type of farm; total expenditures ran to about $86 million. Cash grain farmers spent about $76 million and fruit and nut farmers, about $55 million. These three types of farms accounted for about half of all pesticide purchases in 1965 for the farms represented by the survey.

—Nationally, pesticide expenditures per farm averaged about $300 in 1964. By region, however, average expenditures per farm ranged from a low of $119 in the Northern Plains to a high of $882 in the specialized agricultural production areas found in the Pacific States.

Average pesticide expenditures varied even more by type of farm than by region—going from a low of about $100 for dairy farms and ranches to a high of nearly $1,350 for vegetable farms.

Small farmers not included in the survey spent about $58 million on pesticides in 1964. Thus, total expenditures for pesticides for agricultural uses by all farmers in the U.S. amounted to about $514 million. (*3*)

Bug Budget

U.S. cotton farmers are avid pest controllers. They spent about $8.59 per acre trying to get rid of them in 1964.

Cost of insecticides and fungicides was $5.70 an acre. Herbicides (weeds are pesty, too) took another $1.59. And $1.30 went for defoliants, desiccants and other chemicals. Altogether, pest control was nearly 5 per cent of total production expenses.

Pesticide costs varied geographically, of course. Southern Arizona farmers spent as much as $25.54 an acre; their counterparts in the Black Prairie of Texas spent as little as $3.23.

The cost goes up as acreage increases. Take northeast Arkansas: Farmers with 5 to 50 acres spent only 91 cents per acre for insecticides; those with 50 to 200 acres, $2.05 per acre; and with 200 acres or more, $4.82. (*4*)

Farmstead Engineers on Track of More Efficient Service Buildings

The reward for being right in the selection and use of farm buildings is potentially great.

The penalty for being wrong is also great in terms of reduced efficiency, lost opportunities, and an investment which is unlikely to add to a farm's value.

In these days of rapid economic and technological changes, farmers run considerable risk when they invest heavily in buildings they intend to use for 20 or 30 years.

The amount a farmer puts into new buildings is not necessarily an accurate indication of what the buildings will contribute to his production and profit.

Efficiency and *control* are the key factors today in successful design, selection, combination and use of service buildings. Efficiency means improved input-output ratios. Control takes the guesswork out of final production results.

Well-chosen buildings and associated equipment save more and better-quality forages and feed grains. They increase feed efficiency by reducing the effect of weather.

They make it possible for farmers to work more comfortably, and for livestock to produce more efficiently on a year-round basis.

They increase the productivity of labor. And they put the farmer in a stronger competitive position for hired workers.

The $20-billion U.S. livestock industry gives some idea of the potential contributions of service buildings, and also points up some of the difficulties in measuring results.

Modern farm structures and equipment have already been instrumental in reducing labor for livestock production from 6.3 billion man-hours in 1945 to 3.3 billion hours in 1964.

The need for work centers that increase labor productivity continues to grow. Qualified and dependable farmworkers, especially workers for livestock operations, are increasingly difficult to obtain.

Farm wage rates have risen more rapidly than the cost of any other major resource used in agriculture. They are 60 per cent above the 1950 level and rising steadily; but the index of building

and fencing material costs is only 24 per cent above 1950. It has been relatively stable in the course of the past 10 years.

If livestock buildings are geared to confinement of animals and centralized feed storage, it is possible for one man to handle annually 60 to 70 dairy cows, 250 litters of pigs, 1,200 to 1,500 feeder cattle or perhaps 15,000 laying hens.

The effect of buildings on efficiency of feed conversion can also be an important factor, in view of the fact that feed is usually 65 to 80 per cent of livestock production costs.

For example, feed for the 80 to 90 million hogs slaughtered annually in recent years costs about $2 billion. If improved environment could increase feed efficiency an average of 5 per cent, the savings would about equal the present annual costs of all buildings used in hog production.

With constant-temperature conditions, feed efficiency might be increased even more.

Studies indicate that investment in facilities to control temperature and humidity would be approximately $8 per hog fattened. If two lots of hogs used the same facilities each year, an annual investment of over $16 could be justified for controlling the environment.

The same potential may exist with other types of livestock. But, in the case of beef feeding, controlled environment facilities would cost at least $5 to $7 for each 100 pounds of beef produced.

In modernizing service units, however, farmers should be wary of buildings that overemphasize one contribution to the neglect of others—such as waste management.

In the recent past, some assumed contributions expected from buildings have not materialized in spite of initial investments in the $25,000 to $50,000 range.

Much research has been done and more is in progress. But the perfect set of farm buildings for a given enterprise and situation has yet to be designed. When it is, it will be the result of teamwork by the animal scientist, biologist, nutritionist, engineer, economist —and the farmer himself.

(*This is the second of two articles on the subject of farm buildings; the first was published in the April 1967 issue of the Farm Index.*) (*5*)

It Often Costs Less To Feed Out On The Range Than at Home in a Drylot

Most farming in the Southern Plains Region of Texas and Oklahoma is specialized—cotton, grain or range livestock. A look at the feasibility of adding a cattle feeding enterprise to a cattle ranch operation points out the reason for this. The big bottleneck is feed.

With average yields, as many as 2.5 acres of dry cropland would be required to furnish enough grain and silage to feed one steer 180 days; 1.7 acres to feed a cow in the feedlot 365 days; and .2 of an acre to feed a cow during the winter in a feedlot.

On the basis of the estimated feed requirements and assuming no purchases of grain and roughage, just over half the ranches in the Southern Plains Region have sufficient cropland to produce feed for only 100 steers or less for a 180-day feeding period. Only one in 10 has enough cropland to produce feed for 500 steers. And only one in 25 enough for 1,000 steers.

Thus, to operate feedlot enterprises at anywhere near the level of minimum unit costs, these ranches would have to buy additional feed.

This in turn would call for increased capital investment for equipment to handle and store the feed. As a result, the feeding operation would be pushed out of the supplementary income category since it would be competing with other enterprises of the ranch operation.

There are, however, some situations in which the feedlot enterprise could be added profitably under favorable price-cost relationships. A stocker-feeder program might be added to a range cow-calf program, providing sufficient sorghum stubble and wheat grazing are available. A cow-calf feedlot operation may be a way of increasing ranch size when additional land is unavailable.

Basically, though, the farming and ranching in the Southern Plains Region remains specialized. There are five major types of commercial farms comprising 87 per cent of the total commercial farms in this region. Of the five, 34 per cent are cotton; 16 per cent, cash-grain; 19 per cent, livestock ranches; 22 per cent, livestock; and 9 per cent, general farms. (*6*)

Rise in Crop Production Assisted By Greater Use of Chemical Fertilizer

Crop production for 1980 could measure half again as much per acre as the 1960-64 average, if trends were to continue in the same direction as in the recent past.

Farmers could, in fact, equal the production level of the 1960-64 period on 127 million fewer acres. To do so would take two-and-a-half times the nitrogen used in 1960-64, two times the phosphorus and about one-and-a-half times the potassium.

Putting it another way, farmers could replace an estimated 127 million acres of crop land by substituting 2.9 million tons of NPK —an average of 1 ton of fertilizer for every 16 acres.

Land used for crops during the 1960-64 period averaged 339 million acres. The return per dollar spent for fertilizer was about $2.50.

Farmers applied 6.6 million tons of principal plant nutrients, or an average of 39 pounds per acre. Distribution by nutrients was 3.4 million tons of nitrogen, 1.3 million tons of phosphorus and 1.9 million tons of potassium.

If farmers had been willing to settle for only a $2 return on each dollar spent for fertilizer for their 1960-64 crops, they could have realized the same total production from an estimated 258.7 million acres—80 million less than was actually used.

Fertilizer used on the reduced acreage would have been 13.3 million tons—8.1 million tons of nitrogen, 2.1 million tons of phosphorus and 3.1 million tons of potassium.

The use of nitrogen has actually doubled in 10 years and the index of crop production per acre rose from 79 to 101 between 1954 and 1964 (1960-64=100). Changes in rates of potassium and phosphorus were also substantial.

The rise in crop production cannot be fully attributed to changes in fertilizer. Economists figure that about one-third of the increased output in recent years resulted from the increased application rates. The remaining two-thirds came from other factors, such as technological changes, improved management, shifts in crops to more productive land and the like. (*7*)

Farm Workers Pass Factory Workers As They Both Commute Daily to Jobs

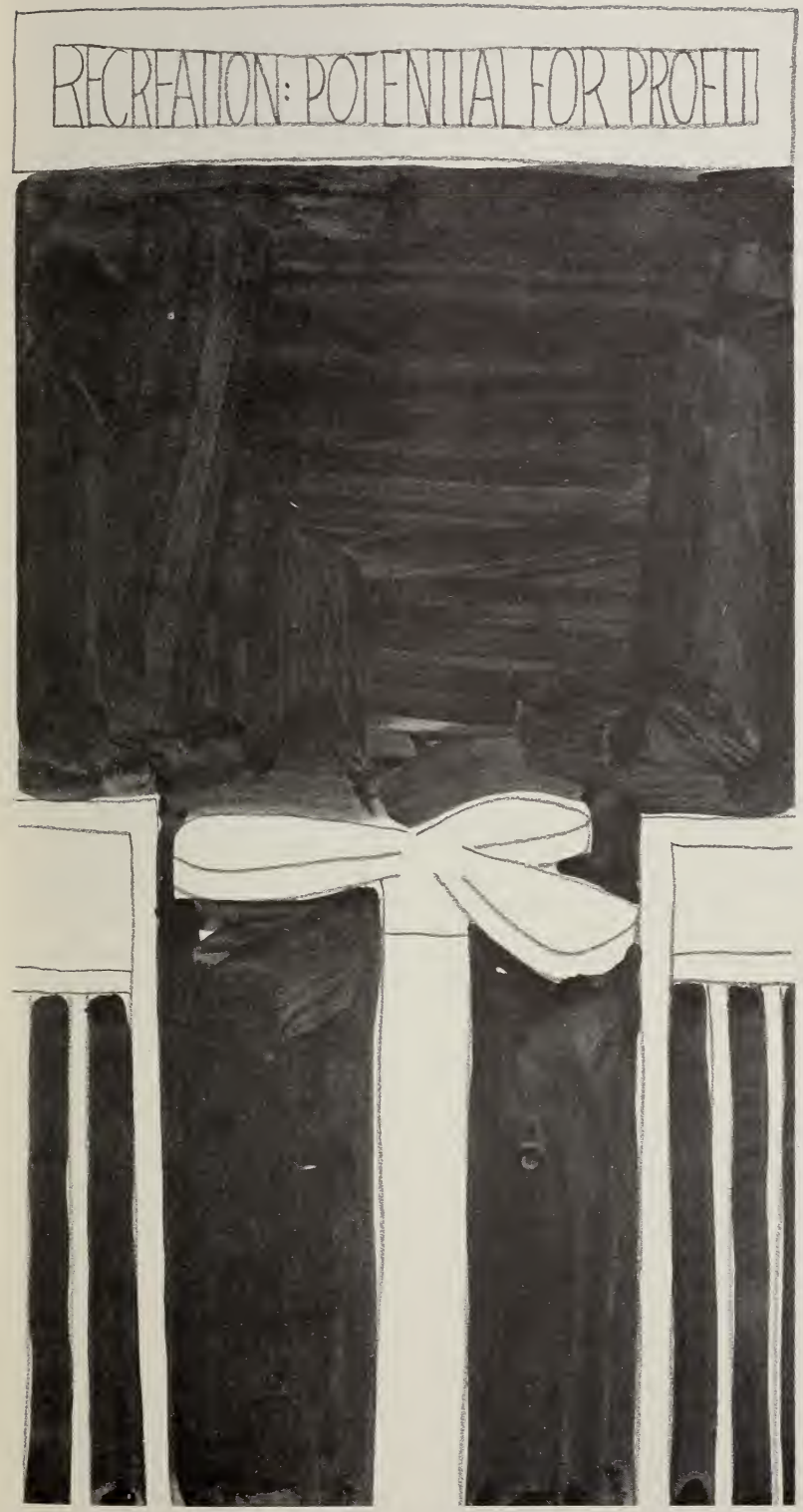
Many farm workers today, like their urban and suburban counterparts, are commuting to work each day. Only instead of heading into the city, they are heading out of it.

Of the average 4.4 million persons who worked in agricultural pursuits in 1966, 1.5 million did not live on a farm.

This means that they had to commute to work just like the suburbanite who works in the city.

What's more, the trend toward farm workers' commuting seems to be accelerating. In 1960, only one-fourth of the people who worked on farms lived elsewhere; now, just six years later, fully one-third of all farm workers live off the farm.

Two factors contribute to this shift: Farmers are using more seasonal hired workers than formerly, most of whom are recruited from the nonfarm population; and modern transportation and technology make it possible for some farmers to separate their residence and place of work. (*8*)



A tour of America's countryside reveals a wealth of land suited for profitable rural recreation enterprises; but too often, it just isn't being used effectively.

There isn't much use setting a mousetrap unless you have mice. Nor is there much point in trying to make money from a business that's inaccessible to customers.

Importance of location is only one of four basic facts underlying the nationwide demand and supply situation for profitable on-the-farm outdoor recreation. In summary:

—Demand is strong and is growing rapidly;

—Most people want relatively simple recreation opportunities: a hiking path, an attractive road for a drive, a place to swim, a shady, ant-free hillside for a picnic;

—People want these resources near where they live; and,

—Suitable land is not running out, it just isn't being used effectively.

The potential for profitable recreation developments on private lands seems to be good—particularly in the East and Midwest, because this is where most of our big cities are. (Public lands generally are concentrated where people are not.)

For example, over $1.2 million of gross income annually from recreation has been reported by 700 Ohio farmers. Most of their farms were in metropolitan counties or adjacent to them.

The farms closest to population centers showed the highest average receipts from recreation. This lends support to the thesis that city people prefer their on-farm "playground" to be reasonably close to home.

The fact that 700 midwest farmers have already averaged more than $1,700 gross income a year from part-time or supplemental enterprises encourages the speculation that this kind of busi-

ness could raise incomes throughout rural America.

Economic studies of such rural recreation enterprises nationwide, however, have been disappointing.

The net returns of many such projects are very low or negative when judged by customary accounting standards. Why? Part of the answer lies in the operation's size and the owner's motivation.

The recreation facilities are frequently small and limited in appeal. Often the operators are retired. Others treat the enterprise as a hobby. Still others operate it as a sideline to another business and aren't much concerned about profit.

These are the general characteristics of probably two-thirds or more of today's farm recreation enterprises.

As long as the operators know what they are doing, and what they might be doing for greater profit, it can be assumed that they are performing a public service by providing recreation benefits to their customers and enjoyment for themselves.

Unfortunately, these businesses present a problem to profit-oriented competitors. Too, they often tend to discourage efforts of technicians trying to help farmers who have a real need to improve their income.

Economics to the contrary, the "hobby" and part-time enterprises aren't likely to go out of business very soon.

They can be likened to small egg production enterprises that existed in the Midwest several years ago. It was "obvious" that they were losing propositions. It was predicted that they would fold up rapidly. But they stayed in production as long as the old man bought the feed and mama got the egg money.

Blind spots of striking similarity are showing up in the current picture of on-farm recreation enterprises. (*9*)

Too Many Fishing Holes May Force Some Operators To Cut Their Bait

The old fishing hole has gone commercial, but . . .

There's less than a 50-50 chance of making money off a fee fishing lake, judging by interviews with Pennsylvanians who have been running lakes long enough to know whether they pay or not.

Out of 89 pay-to-fish enterprises, 46 had lost anywhere from a few hundred dollars to $9,000. Profits by the other 45 ranged from a few dollars to $17,000—after deducting for expenses, equipment depreciation and interest on investment. Only 13 firms had gross returns of over $1,000, while 32 firms had losses over that amount.

Why hasn't fee fishing been more profitable? The main reason seems to be that there are now more lakes offering fishing for a fee than there are fishermen willing to pay the price. Of course, some of the lakes are operated more as a hobby than for their potential profit.

However, voices of experience offer some helpful hints to entrepreneurs who want to pit their lake against that of a competitor.

—Competition from neighboring lakes isn't necessarily harmful; if a lake is part of a cluster with a good reputation, it may be an advantage.

—There's nothing to be gained by overstocking catchable-size fish for ponds that already have species capable of reproducing themselves; or by stocking fish that are incompatible.

—Chances of making money are better if a fishing enterprise has its own hatchery.

—Refreshment stands and swimming facilities tend to lure customers.

—Trout hold no significantly greater appeal than other fish.

—Lakes that are too small or too "artificial" don't get much business.

—Efficient use of labor, well-kept records and other good business practices pay off.

Above all, it frequently takes money to make money. Allowance must be made for taxes, licenses, fish stock and feed, advertising, equipment, labor and insurance.

Liability insurance can be a sizable, though advisable, expense. Rate of risk is relatively high for water-based recreational enterprises. And if fishermen are allowed to swim as well as angle, insurance rates are much higher than if customers were restricted to lakeshore or boat. (*10*)

Beauty Is Its Own Reward—But Adds A Spot of Cash To Attract Followers

Does beauty pay?

Ask the restaurant owner or the gas station operator in the middle of a scenic area. The autumn leaves, the snow capped mountains, or uncluttered beaches attract the tourists—and their dollars.

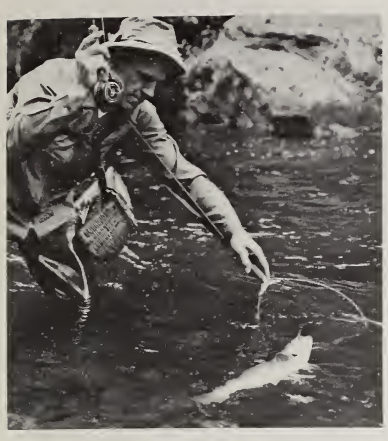
Even open space has a value—witness the families who continue to live in the midst of farmland, commuting to the city.

And a house with a spectacular view is a house with a bigger price tag.

Industry too, has a taste for beauty. Many is the factory, light industry, or large office building located in the open country, surrounded by green lawns, shrubs, and space. The owners knew the attractive setting would pay off in employee productivity.

Beauty, worked into a multi-purpose resource plan, helps justify optimum uses of land resources. It helps justify saving the most fertile soils for farming, shifting soils of limited potential productivity into uses for which they are adapted.

Preservation of an agricultural industry in many communities may depend on the values placed both on the farm business and on a balanced, aesthetically satisfying rural environment. (*11*)



Pigs for Profit? Piedmont Figures Say They Best Horses in an Income Race

Which would be more profitable: people or pigs?

Any farmer in the North Carolina Piedmont must seriously ask himself this question when he thinks about adding a recreation enterprise to his farm.

Take the pigs. Production of feeder pigs is especially profitable on Piedmont farms. Annual net returns from 24 sows (producing two litters a year to be sold as 40-pound feeder pigs) amount to about $1,569.

How do the returns from recreation stack up against those from pigs?

ERS economists, in cooperation with the North Carolina Agricultural Experiment Station, recently used budget data for high-level management situations and linear programming to weigh the economic potential of four types of recreation facilities in favorable market areas against feeder pig production and other conventional farm enterprises in the Piedmont.

The recreation enterprises included: a private, transient-type campground with 30 improved tent sites; a three-acre lake for fee fishing; a nine-hole golf course; and a 10-horse riding stable. The conventional farm enterprises were feeder pigs, layers, broilers, corn, barley, soybeans, wheat, sweet potatoes and flue-cured tobacco.

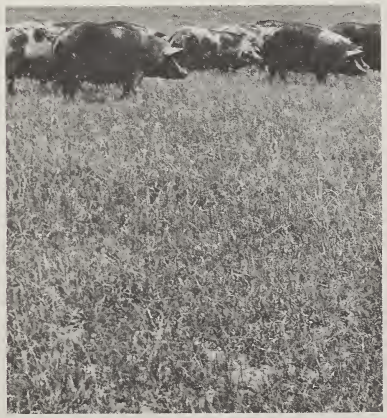
Here are some of the study's findings:

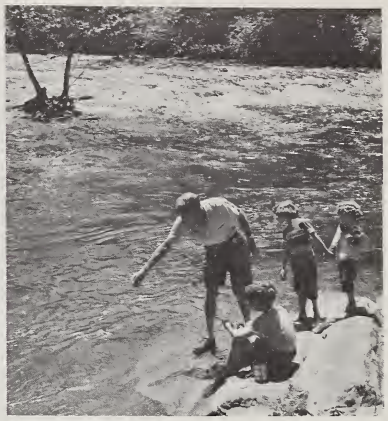
Private campgrounds. A campground with facilities for 30 improved tent sites generally required 10 acres of land, about 1,000 hours of labor from March through October. Annual net returns ranged from $1,167 to $2,189.

For Piedmont farms with a feeder pig enterprise, diverting labor from pig production to devote to a campground generally reduced farm income—in one case by as much as $7,645. This was because net returns per hour of labor from March to October were almost twice as high for feeder pigs as for a campground.

However, when feeder pigs were not part of the farm enterprise, the campground was usually a profitable undertaking. The largest increase in net farm income as a result of adding a campground was $1,570—and occurred on small farms with only 19 acres of cropland.

Golf course. A nine-hole golf course required from 50 to 80 acres of land, which meant it was a feasible undertaking only on medium (119 acres) and large (269 acres) Piedmont farms. Labor needs were very high. Operating a course required the services of a full-time greens manager, maintenance man and snackbar attendant working year-round. Annual net returns from a golf course ranged from $7,163 to $11,776.





As with the campground, the returns from a golf course did not match those that could be obtained from the production of feeder pigs on Piedmont farms. Annual farm income dropped by as much as $8,770 when a golf course was added at the expense of pig production. But when feeder pigs were eliminated as a production alternative, the golf course was a profitable undertaking compared with conventional crops and boosted net farm income by as much as $7,460.

Three-acre fee fishing lake. Including access roads, a fee fishing lake required about six acres of land and about 224 hours of labor from March through October. Annual net returns ranged from $204 to $564.

Although profits were small, the fishing enterprise paid off for more Piedmont farms, with or without a feeder pig enterprise, than any other recreational facility studied. Tending the lake didn't divert much labor from conventional farm enterprises. The largest increase in net farm income attributable to pay fishing was $560, and occurred on small farms with a low ratio of cropland to labor.

Ten-horse riding stable. Land requirements amounted to about 100 acres (90 for the riding area

and 10 for pasture). Labor needs were extremely high—about 3,270 hours from January through December.

Annual net returns from the riding stable ranged from $469 to $1,931; net returns per hour of labor were lower than for any other recreational facility or conventional farm enterprise studied. Consequently, the riding stable reduced farm income drastically.

On farms with a feeder pig enterprise, adding a riding stable at the expense of pig production lowered farm income by as much as $13,190. Even on farms without feeder pigs, the riding stable was still unprofitable—lowering net farm income anywhere from $1,690 to $3,695.

The study stressed that even if establishing a recreation facility on the farm may appear promising, serious attention must be given to estimating the number of customers that can be attracted to it. Farm location is a major factor affecting the demand for most recreational enterprises.

Also, the proximity of the proposed facility to similar facilities, either privately or publicly owned, should also be considered. One transient campground near a small town might be profitable, but the establishment of another nearby could make them both unprofitable. (*12*)

Farmer Beware! Law Suits Cost; The Farm You Save May Be Yours

Along with their conventional crop and livestock enterprises, many farmers have added recreational activities for paying guests. But on occasion, farmers have also been sued for injuries to guests using these facilities.

Any farm operator considering a recreational or tourist enterprise for his farm should consider the possibility of an injury occurring to a guest and the resulting lawsuit. If the farmer loses, the award in court might well wipe out any profit from his enterprise or even his life savings.

Here are the highlights of a recent ERS study on strategies a property owner can use to limit or transfer the liability for accidents occurring on his premises:

Warning and repair of dangerous conditions. A sign or spoken warning of potentially dangerous conditions existing on the land in many instances will relieve a farmer of responsibility if a guest is injured by such conditions. However, signs and oral warnings may not reduce a farmer's liability for injury to young children.

Some ways to lessen liability for injury to children are (1) placing large signs at the entrance to the farm or recreation facility stating that children should be under control of their parents at all times; (2) posting rules and regulations to inform guests about permissible conduct; and (3) posting signs giving speed limits and other warnings to motorists in the area.

When an item of personal property—such as a boat, fishing rod or hand tool—is provided to a guest free of charge, a warning as to any defect is usually sufficient to limit the owner's liability for injury. However, if a fee is charged for the article, the owner has a duty to inspect and warn of dangerous conditions. If the article is incapable of safe use in its present condition, repairs should be made before the property is given to the user.

Exclusion of unruly guests. The owner of a recreational enterprise may limit his liability by excluding or evicting unruly guests (a law enforcement officer should be called if physical eviction is necessary).

The owner should be on the lookout for the boisterous or unruly patron. If such conduct is known, or should have been known, by the owner and he does nothing about it, he could be liable if an unruly patron injures another guest.

Incorporation. Incorporating the recreational enterprise is another way of limiting a farmer's liability in case of injury.

A corporation is an artificial person created under and operating according to state corporation laws. Technically, the corporation owns the property and a liability claim against the business concern is limited to the value of its assets. In this way the farmer can protect his profits from conventional farm enterprises as well as his savings.

However, there are many problems involved in organizing and operating a corporation and a farmer should seek the advice of an attorney and a business analyst before taking such a step.

Liability insurance. This is the best form of protection that can be obtained by the operators of most recreational enterprises. Insurance does not eliminate the risk but it does shift the risk to someone else. The insurance company, not the farmer, pays for damages.

There are several types of policies available. Some companies have policies that cover the recreation enterprise specifically; others will attach a rider to their farm liability policy.

Unfortunately, the insurance for some types of recreational enterprises is expensive because injuries occur frequently. This is especially true of riding stables and the like. Incorporation might be the cheapest method of limiting liability. (*13*)

Signs of Irresponsibility

Use of a disclaimer clause or posting a sign stating "not responsible for accidents incurred while on the premises" will not relieve an operator of liability if an accident occurs. A landowner is obliged to use reasonable care to safeguard the lives and property of others while they are on his premises. (*13*)

Ozark Area Discovers Importance of Catering to Vagaries of Vacationers

Working wives would rather spend their vacation fishing than catching up on household chores.

Carpenters take more long hunting trips than lawyers.

The longer a person has owned a boat, the more overnight boating trips he's likely to take.

Bass, bluegill and catfish rate tops with fishermen.

All true, judging by an ERS survey of vacationers using recreation facilities.

There are other things, too, that an Ozark vacationland operator should know about his prospective non-local customers.

Best lures for anglers are the probability of making a catch, accessibility and convenience of the recreation area, and assurance that fish are really there.

Dissatisfied fishermen who won't come back next year are most likely to say that the fishing ground offered no challenge, was overcrowded, lacked privacy and was too expensive.

Boaters are less specific in their requirements, but most of them prefer other water-based activities (water skiing, swimming and fishing) when they aren't boating. Few encumber themselves with golf clubs or skeet guns.

Travel distance to a recreation area is also important to Ozark-bound sportsmen. However, road conditions and availability and quality of places to eat and sleep en route appear to be of more concern than travel costs. Credit cards have lessened the impact of money considerations.

Sizing up prospects for Ozark recreation areas, visitors to the region cite a need for:

—More and better north-south highways, and more state parks;

—Business services and merchandise that tie in with types of recreation offered; and

—Better spacing and quality of on-the-road accommodations. (*14*)

Machines Smooth Seasonal Valleys For Farmer; Deepen Them for Help

Fewer farms and more machines are two big factors in the recent shift to a more uniform, less seasonal pattern of employment for the family farmworker.

Seasonality is the spread between percentages by which the employment in peak and low months departs from the annual average.

Back in 1955, the range between the low and peak points of family labor on U.S. farms was about 45 per cent of the yearly average. In 1965, the spread was only 33 per cent.

The Southeast and Delta Regions showed the greatest declines in the seasonality of family employment between 1955 and 1965. As recently as 12 years ago, there were many small cotton farms in these regions using hand methods that required large numbers of workers for short periods. Today these farms have largely disappeared and cotton is produced with more mechanized methods.

In 1955, the monthly employment of farm operators and family workers in the Southeast varied from 35 per cent below the annual average in January to 65 per cent above in September during the peak cotton picking season —a range of about 100 percentage points. By 1965, the monthly range for the region was down to only 65 percentage points.

For hired farmworkers, however, employment patterns became more seasonal, rather than less, during 1955-65. Only in the Southeast, Delta and Southern Plains did the seasonality of hired labor needs drop—primarily because of increased mechanization in cotton harvesting.

The seasonality of hired farm labor increased most rapidly in the Appalachian Region during 1955-65. In this region tobacco was No. 1 user of labor and its labor needs are highly seasonal. (*15*)

The Poor Are Blessed With Attitudes Helping To Insure Continued Poverty

The poor are always with us, the saying goes. But for a long-familiar phenomenon, poverty is surprisingly little understood.

Such ignorance makes it that much harder to understand the problems of the poor, to work with them, to find solutions.

Here and there, however, a study of the social mechanism of poverty provides some insight into the world of the under-privileged.

Poverty in farming, according to some of the studies, turns up on the smallest and least productive farms. The farmers have fewer acres in cropland, smaller livestock enterprises.

The poor farmer is also somewhat tradition-bound and slow to change. When he picks up a new idea, he is apt to be the last to do so—never the first. New ways more than likely are forced on him. Bulk tanks, for example, were adapted by the poorer farmer only when the milk plant or the health department forced the farmer to install them.

It is said the low income farmer places a high value on freedom, higher even than farmers in general. If true, this along with a generally negative attitude toward credit, would make it difficult for him to use loan sources effectively.

Just in general, the poor farmer has a highly developed skeptical—even suspicious—side to his nature. This is particularly true of anything having to do with strangers. The problem is all the more difficult because the poor tend to be suspicious even of those in their own group who are known to have "too much to do with outsiders."

The distrust of outsiders carries over to education. Indications are that low income people recognize the value of education in today's world. Even so, they often do not encourage their children to stay in school.

Also, when one of the poor does try to improve himself through more education, chances are he will have to buck the criticism of family and friend alike.

The attitude toward money, too, is a thing apart for the poor. When a little money comes along, it gets spent. Satisfaction tends to come from immediate gratification. (*16*)

Many Full-Time Farm Workers Might As Well Be Unemployed Six Months

Joe S. was 33 years old in 1960. He had an eighth grade education and a full-time, year-round job paying him $2,250.

Joe would never have been classified as an unemployed worker. Yet in a way he was. Reason: His annual earnings were only half the nationwide average for a male between 30 and 34 years of age with a comparable education. On the basis of economic productivity compared with economic potential, Joe might just as well have been out of work for six months.

The term used to describe Joe's job predicament is *economic underemployment*. Recently, ERS economists measured the extent of economic underemployment during 1960 in the Appalachian Region (which includes 373 counties in 12 states).

An equivalent of 765,000 persons—or 12.6 per cent of the region's labor force—might just as well have been considered jobless in 1960 as a result of economic underemployment.

Portions of three states with counties in Appalachia had an equivalent of more than 100,000 persons unemployed as a result of economic underemployment in 1960. These states were: Alabama (123,000); Pennsylvania (135,000); and Tennessee (124,000). Kentucky, Tennessee and Virginia each had more than 20 per cent underemployment in their portions of the Appalachian Region. (*17*)

New Skills Are Needed Everywhere; Rural America Is Not An Exception

Remember the "baby boom" during and after World War II?

Today, those postwar babies are young adults. By 1970, they will be well out of their teens, ranging from 20 to 29.

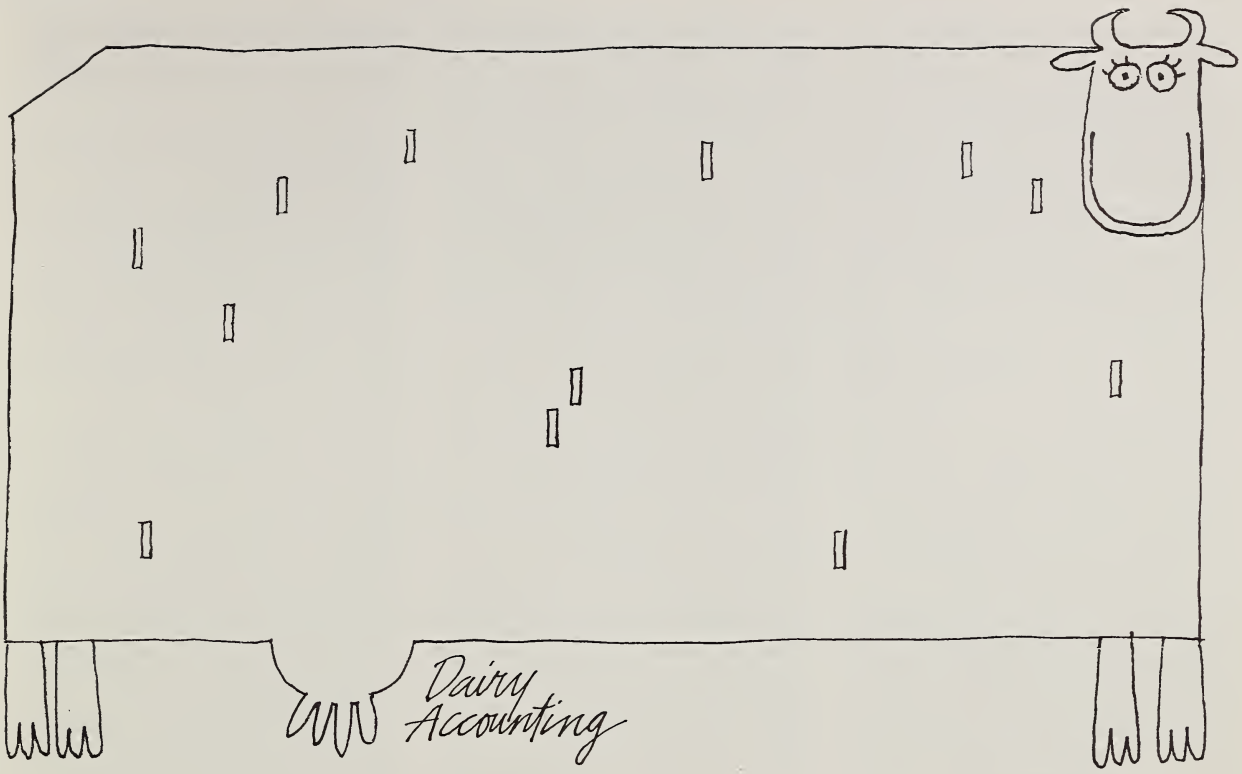
If there were no rural-urban migration during the present decade, the number of rural young people would increase by over four million by 1970. Even if they were to continue to migrate to town at the estimated 1950-60 rate, there would still be half a million more young people, ready and able to work in rural America, than there were available for similar tasks in 1960.

What is the job outlook for these young people? Should they seek their fortunes in the city or find happiness in their own back yards? The shadow of possible unemployment or underemployment looms ominously on either horizon.

If they make the shift to the city, they may find that they do not have the skills required for good, steady work in town. If they stay in rural America and hope for the best, they may not find enough good opportunities opening up. It is a difficult choice, yet thousands are faced with this, and most choose to take their chances in the city.

Growth in job opportunity, training and development will be necessary in both rural and urban America to insure the future of this younger generation.

A number of government programs have been started or proposed which are designed to encourage economic development. These include the Public Works and Economic Development Act of 1965, the Elementary and Secondary Education Act and enlarged authority for vocational education, the Rural Areas Development Program and the Economic Opportunity Act. (*18*)



You've got to have a system, of course, but computerizing it may not necessarily make it better. Many dairies, in fact, find new automation not worth extra cost.

Sales on the dairy route. Market analysis. Cost accounting. Milk producers payroll. The list of working information needed by the typical dairy firm is endless.

Almost all of it could be fed into a computer. But no firm has any assurance that the more elaborate the bookkeeping machinery, the better or more timely the information. Nor, for that matter, do they know whether the value of the information will offset the cost of providing it.

A recent study by Purdue University in cooperation with the Economic Research Service provides some comparison of the different information systems employed by milk dealers. A few points of the comparison are:

Manual systems. In the era of the computer, it is hard to remember that adding machines, desk calculators and such are also data processing machinery.

Even when a dairy has 100 routes or more, a well-designed manual information system has plenty of strength in it when it comes to competing with other systems on a cost basis.

In one comparison of systems, for example, a manual system actually provided the needed information at lower accounting costs per route than more elaborate information machinery. A better use of the machinery at hand played at least some part in keeping down the labor costs.

But a manager who wants something more than basic accounting figures would find himself hamstrung by a manual system. More information and more timely information at the same or only slightly greater cost are major motivations for automation.

Small computer systems. These are the desk size units or accounting machines that are tied to a small electronic computer.

In some of the comparisons, direct accounting costs were a little higher for the small computer systems than they were with the manual systems. But the small computer system processed more information, and the conclusions were available much earlier.

Price lists can pose special problems for the small computer system, if the office wants to use a stored list for route accounting. The problem is that many a firm has a combined retail-wholesale list exceeding the storage capacity of a small computer.

For many of these systems, about 40 routes—plus the producer payroll—will maintain a useful volume of accounting and processing of information. Most large manual systems could be at least partially automated in this way.

Service centers. Service centers make it possible for the dairy to take care of work that is too much for the small-scale, in-house system, too little for a full-size operation. The center can also give the company a gradual introduction to the problems that go along with automatic data processing.

In terms of actual costs, the centers frequently offer no real advantage over an in-plant system. The center can, in fact, turn out to be more expensive by the time all the other costs are added into the bill.

But the current trend on the part of many service centers to install larger machines — with their lower costs per calculation— may change this cost relation.

Unit record systems. Conventional unit record equipment could take care of route accounting and sales analysis, producer payroll and cost accounting for the firm of the right size. Other applications such as the payroll could be added for larger firms.

But even though costs could prove favorable for the unit record system, management might think twice before installing such a system. It is possible, for example, to get the same information at the same cost with small computers or with small computers feeding a service center. These arrangements would result in little difference in the time-lag.

Such a combination of information systems could offer more flexibility for future installations. Going from a manual system to a unit record system demands extensive changes. And they are hard to reverse should the new system prove a failure.

Those who use the unit record systems—whether of the conventional type or the high speed models—seem satisfied with their machinery, even when costs are higher than they were for manual systems used in the past.

They reason that their pay-off is not in lower costs but in the greater volume of information, higher quality, or more timely reports.

Standard computer systems. These are in-plant stored-program computers. The firms are equipped with medium-scale, general purpose systems intended primarily for business use.

For all but one firm in the study, the move was from unit-record equipment to the computers.

The experience of some of the companies studied suggests an upper limit of usefulness for card-based systems of around 6,000 producers for a producer cooperative without fluid route sales. But beyond 6,000 producers, the company needs a system with greater speed (such as a tape computer system) than a simple card computer can provide.

At least 100 routes are needed for competitive costs in firms with fluid route sales predominating. (*19*)

C'est Sago

Palm trees may conjure up visions of tropical isles for some people. In trading circles they're more likely to mean fibers for brushes, leaves for fans, oils for soap, waxes for shoepolish—and even starch.

The sago palm is a member of a palm family whose trunks or enormous flower stems harbor a pithy deposit from which starch is extracted.

The trees are particularly fond of the climate in the Indonesian archipelago, including the big island of Borneo.

Sago palms take about 15 years to flower. If the flower's fruit is allowed to ripen it absorbs all the starchy pith. So the trees are usually cut down and the starch extracted before the fruit ripens.

Natives use sago starch mainly for cakes and soups. Abroad it is also used as an industrial starch.

The exported product is mixed with water, made into a paste and sieved into small grains. Hence the appellation, according to size, of "pearl sago" and "bullet sago." (*20*)

Starch Is Facing Stiff Competition From Synthetics in Textile Industry

Boiled starch, cold starch, spray starch. Each has its followers in laundry circles.

But the starch industry is more concerned about sales to textile manufacturers, who normally use about 375 million pounds a year.

Time was, 30 years ago, that the textile industry took over 42 per cent of the 350 million pounds of starch made for industrial (nonfood) use.

While industrial starch output rose to over 1,800 million pounds a year in 1960-64, the percentage used by textile manufacturers dropped to about 18 per cent.

One reason: roughly 13 per cent of the traditional market for textiles has been lost over the past two decades to such nontextile materials as paper, plastics, rubber and glass.

Another reason: starch itself has been facing stiff competition —and losing ground—to synthetics, especially for textile finishing processes and color printing of cloth.

As a sizing agent, however, starch still holds a firm economic advantage over its chemical competitors. It continues to be the main product used for sizing man-made, blended and natural fiber yarns used in textiles.

(When yarns are "sized," the fibers are coated with starch. This protects them from abrasion during weaving.)

Corn starch—the type most widely used in textiles—accounted for about 315 million pounds of the 375 million pounds of starch used annually by commercial spinners, weavers and finishers in 1960-64.

Other starches used in significant volume are wheat, potato, tapioca, and dextrin (derived from corn starch). Rice and sago starches are occasionally used too, mainly for special processes such as silk-screen printing. (*21*)

First Four in Each Field Process Fifth of All Turkeys and Broilers

Business in the poultry and egg industry tends to flock to the top companies. While the livestock industry in recent years has become increasingly widespread and less centralized, poultry processing has become an evermore concentrated business.

In 1964, the four largest broiler processors handled 18 per cent of the federally inspected slaughter —up from 12 per cent in 1958.

And about a fifth of the federally inspected turkey slaughter in 1964 was the work of the top four firms as was a quarter of the total output for liquid and frozen eggs.

The changes that have been taking place in the poultry and egg industry are:

Contract production continues to spread. One sample of the industry indicated that broiler processors got over two-thirds of their supplies from direct contract production in 1964. It was little more than a third in 1959. Turkey processors got more than a third of their supplies direct from contract producers in 1964, about half that in 1959.

The type of contract, too, has changed. More and more the contracts shift the burden of management and the risk of production from producer to contractor.

Formula pricing is widespread. Some 42 per cent of the processed chicken, 28 per cent of the processed turkey and 72 per cent of the eggs handled are priced according to a formula system. Such formulas are based on differentials related to established market quotations.

Wide variations characterize earning rates. For the years 1959 to 1964, net income after taxes averaged 7.7 per cent of net worth for a sample of chicken processors. For turkey processors, it was 17.8 per cent, and for egg firms, it was 12.8 per cent. In 1963 and 1964, earnings ranged from less than 5 per cent for some firms to over 15 per cent for the top third.

The buyer has the strength. When concessions are made, the seller, not the buyer, is most apt to make them. Egg handlers, for instance, yield to the buyer's preferences in bidding for the right to supply new stores or to hold accounts. Or a retailer may buy turkeys under a processor's brand only if the processor also packs turkeys or other items under the retailer's label.

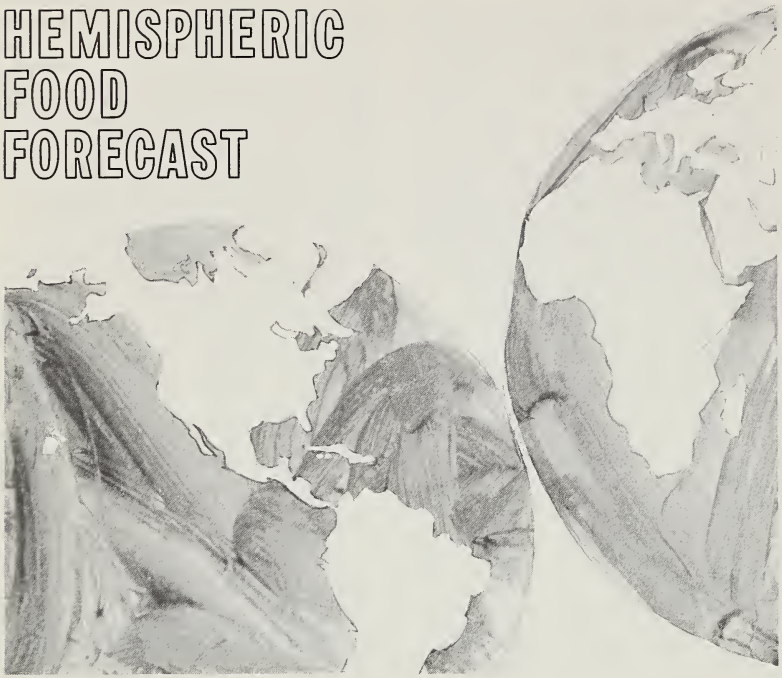
And for the future. Vertical integration may make the same inroads in turkey and egg production that it has with broilers. The efficiencies that result are too great to be ignored by the astute turkey processor.

Most likely there will be a greater emphasis on product differentiation, more intense regional and national sales drives. Along with this trend there should also be a proliferation of processed poultry products and stepped up advertising and promotion campaigns. (*22*)

LOWER PRICES, WIDER MARGINS: That's the margin story for eggs. Both the farm to wholesale and retail spreads have widened slightly. Higher costs for wages and other items have been partly offset by increased efficiency. Quality is better and packaging more attractive, too, than it was in earlier years. (*22*)

Year	Retail price to consumers	Wholesale price to retailers	Farm value	Farm to retail spread	Farmer's share
	Cents per dozen	Cents per dozen	Cents per dozen	Cents per pound	Per cent
1947	67.1	59.1	47.8	19.3	71
1950	58.2	51.2	38.0	20.2	65
1955	59.8	52.7	40.1	19.7	67
1960	56.6	48.8	37.1	19.5	66
1961	56.6	47.9	35.9	20.7	63
1962	53.3	44.2	32.2	21.1	60
1963	54.4	45.3	33.4	21.0	61
1964	53.9	44.5	32.9	21.0	61
1965	53.8	43.6	30.6	23.2	57

HEMISPHERIC FOOD FORECAST



Fair, but not quite as sunny as in 1966, is the overall food forecast for the Western Hemisphere. Both losers and reapers dot the agricultural landscape all the way from Cape Horn's tip to Hudson's Bay.

The outlook for Western Hemisphere agriculture in 1967 is bright despite—or perhaps because of—mixed trends in 1966.

Last year agricultural output in Canada rose almost 10 per cent while Latin America, overall, showed a 3 per cent drop. The drastic reduction in Brazilian coffee output was responsible for a large part of this drop.

In 1967 Canada is expected to continue food production at a high level and, barring the twin pitfalls of inflation and recession, Mexico and most Caribbean, Central American and South American countries should also show gains, resuming the general uptrend of the 1960's.

(The United States, its possessions and Puerto Rico are not included in these Western Hemisphere figures.)

In *Canada,* boosted by this country's sixth year of uninterrupted economic growth, farm income climbed to a record $3.7 billion in 1966. Production gained in all major field crops except oats, rye, flaxseed and sugarbeets. The wheat harvest of 23.0 million tons exceeded 1965's record high by 30 per cent.

Canadian cattle marketings also made new records early in 1966, but fell back to a total for the year slightly below that of 1965. Poultry meat production went up 10 per cent while 1965's decline in dairy cattle numbers continued.

In *Latin America,* food production dropped almost 1 per cent with larger declines in commercial crops for domestic and export use. A 6 per cent decline in crop output more than offset a near 4 per cent gain in livestock products. On a per capita basis, Latin America's total agricultural food and crop output slipped well behind a population growth of 2.9 per cent. The bright spot was a slight gain in livestock products.

Mexico registered a 6.5 per cent rise in real gross national product in 1966. Crop production, however, dropped over 3 per cent per capita. Total wheat output was almost one-fourth down from last year. But the sorghum grain harvest was up 54 per cent, rice up 5 per cent and livestock products up 5 per cent above 1965.

The *Caribbean Area* divides between countries with economies hit by political unrest and Hurricane Inez and politically stable countries afflicted by alternating drought and deluge.

Cuba suffered a sharp drop in sugar output due to over-cutting of the 1965 crop and early drought. The *Dominican Republic* increased crop production 4 per cent. Mining and industry improved *Jamaica's* economy as did oil and tourism for *Trinidad* and *Tobago* though agriculture contributed little. And *Haiti* showed little economic and no agricultural progress.

In *Central America,* a drought early in 1966 and above-normal rainfall later in the year worked at cross purposes, producing bumper crops in some places, severe reductions elsewhere.

The gross national product of *Panama* was up 8 per cent over 1965; *Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua* and *British Honduras* all showed gains of about 6 per cent. But Guatemala and Panama both showed declines in farm output.

In *South America,* recessions and economic downturns in some countries countered gains in others. Economic output increased in nine out of the 11 countries in this area, but only two countries achieved a rate of growth meeting Alliance for Progress objectives of 2.5 per cent per capita per year.

Argentina suffered an economic decline though crop production increased nearly 4 per cent and the livestock index rose 14 per cent to match 1964's high in total agricultural output. *Brazil's* econ-

omy, with a 41 per cent cost of living increase, showed a 15 per cent decline in crop production (mostly coffee) though livestock output continued at the 1965 level. Coffee exports—about 80 per cent of Brazil's trade—rose sharply.

Bolivia showed a 2 per cent increase in food production and an improved mining output. *Chile,* with mineral resources buoying up the economy, had a 1 per cent drop in crop output. *Colombia's* crop production went up over 2 per cent. *Ecuador* showed a small increase in agricultural output. And *Peru* lifted its economy with new investments as food production went down slightly.

Agricultural and foreign trade gains raised the economy of *Guyana* (formerly British Guiana). *Paraguay* continued at a high economic level despite a farm output drop. And *Venezuela's* economy showed larger industrial than agricultural gains.

Uruguay's drop in both farm and nonfarm output combined to result in an overall decline in GNP of almost 1 per cent. (*23*)

Oilseed Prospectors Make a Strike In the World's Sunflower Patches

For Peruvians, it's a national emblem. For Kansans, it's a state flower. And for farmers and traders the world over, it symbolizes a bright future for vegetable oils.

The sunflower, of course.

Its seeds have become the core of one of the world's fastest growing food oil industries.

Sunflower seed oil, at an estimated 3.1 million tons in 1967, now ranks third in world output of edible oils. Production has nearly doubled since 1957, and world exports of seed and oil have increased fivefold.

Soybean oil continues to be well up front in edible oil production, and peanut oil is second-ranking (see chart, page 4).

Sunflower seed oil's surge in volume is due largely to the bumper 1966 crop in the USSR, which accounts for about 70 per cent of the world harvest.

Through hybridization, the Soviet Union has raised oil yield from sunflower seed to between 40 and 44 per cent; it was 27 to 31 per cent in 1950. (Oil yield from U.S. soybeans is about 18 per cent.)

The improved oil content now makes it possible for sunflower seed to compete in the world market with soybeans as a source of edible oil. World exports of sunflower seed and oil—though still only a fifth as large as comparable soybean exports—have already risen from 143,000 tons in 1957 to 609,000 tons in 1966 (in terms of oil).

Nearly 85 per cent of last year's exports came from the USSR and Communist countries of southeast Europe. A sizable quantity came from Argentina, and small amounts from Canada, France, Africa and Asia.

Three of last year's major customers for sunflower seed and oil —West Germany, Italy and Spain —were also big importers of U.S. soybeans and soybean oil. More recently, Japan has reportedly bought sunflower seed from the Soviet Union. (*24*)

LATIN IMPORTS HEAD U.S. LIST. Total agricultural imports by the U.S. reached a near record in fiscal year 1966 and, once again, the Latin Americans contributed the lion's share.

Last year $4,454 million in agricultural products were imported by the U.S.—up 12 per cent from 1965 and the largest increase in imports since 1951.

However, exports of agricultural products totaling $6.7 billion in fiscal year 1966 continued to exceed imports.

Latin America's share of imports, $1,801 million, increased 10 per cent and topped those from any other area.

A record import level of supplementary (partially competitive) products of $2,628 million accounts for 94 per cent of the total increase. (*25*)

VALUE OF U.S. AGRICULTURAL IMPORTS BY AREAS*

Area	1961	1962	1963	1964	1965	1966
	Million dollars					
Latin America	1,690	1,606	1,656	1,739	1,641	1,801
Asia	701	739	726	753	761	770
Europe	506	535	554	555	594	700
Africa	366	381	393	451	472	520
Oceania	219	302	393	424	332	408
Canada	159	204	185	174	187	255
Total	3,641	3,767	3,907	4,096	3,987	4,454

* Fiscal Year

Profit from Exports Is Much Bigger Than Bill for Imports of Farm Fare

Our U.S. exports of farm products in 1966 rose at a faster clip than our imports of farm commodities.

Net result: The nation's agricultural balance of trade was on the black side of the ledger with a surplus of $2,393 million—about 12 per cent higher than the surplus in 1965.

Here's the box score:

	1965	1966
Exports	$6,229,000	$6,885,000
Imports	$4,087,000	$4,492,000

Commercial farm exports for dollars (or "hard" currencies convertible to dollars) added up to about $5,322 million last year—$830 million more than total agricultural imports.

Sharpest import gains were for supplementary products, such as sugar and wool and dairy products. These types of commodities add volume or variety to our own production.

Farm products made up 23 per cent of total U.S. exports in 1966—the same proportion as in 1965 but slightly below a constant 24 per cent from 1960 through 1964.

On the other side of the fence, nonagricultural exports grew less rapidly than imports last year. Surplus of exports over imports narrowed to $2,111 million from $3,574 million in 1965.

Total nonagricultural exports stood at $23,027 million in 1966, compared with $20,777 in 1965. Comparable figures for imports were $20,916 million and $17,203 million. (*26*)

Trade Winds Veering Only Slightly From U.S. Shores to COMECON

[An in-the-news acronym—COMECON—is one of that long list of interlocked initials so important in world affairs.

COMECON is the Committee on Mutual Economic Cooperation.

Soviet-sponsored, it coordinates the economic affairs of the USSR, Bulgaria, Czechoslovakia, Hungary, Poland, Rumania, and the Soviet zone of Germany, including East Berlin.

To complicate matters, COMECON is also known as CEMA (Council for Mutual Economic Assistance). Called by any name, it was created in 1949 as a counterpart of the European Recovery Program, alias Marshall Plan.

COMECON is neither a free trade area nor a customs union. It is primarily a planning structure to coordinate the trade of member countries who are interconnected through bilateral trade agreements. The members then regulate their trade through state monopoly agencies.]

Agricultural trade between the United States and the seven COMECON members has not been brisk in recent years, but it has nevertheless increased in value.

Exports of U.S. farm products to the state-controlled areas of Eastern Europe averaged $151 million in the five year period 1961-65, compared with only $45 million in 1955-59.

The USSR supplanted Poland as our leading COMECON agricultural customer, and there was an uptrend in sales to the other members.

Imports by the U.S. of agricultural products from the area have also risen in value—from an average of $28 million in 1955-59 to $44 million in 1965. But their importance in relation to total trade with COMECON has declined. Canned hams from Poland are the dominant item.

Major agricultural suppliers to COMECON have been Cuba, Canada, Egypt, India, Australia, France, Argentina and Yugoslavia

U.S. farm products are generally competitive in price and quality with those of other suppliers. So, if trade controls on both sides are loosened, our trade with COMECON will probably expand. This would mean larger incomes for U.S. farmers, traders, and processors, and would also improve our international balance-of-trade position. (*27*)

Foreign Spotlight

WEST EUROPE. West Europe's combined real gross national product rose 3.5 per cent in 1966, compared with 4 per cent in 1965 and a long-term rate of 4.5 to 5 per cent. All countries except France, Italy, Norway, and Sweden had below-average growth.

MAINLAND CHINA. Chemical fertilizer imports in 1967 may exceed 6 million tons, compared with 3.5 million in 1966 and 2.5 million in 1965. Purchases from Free World supplies begun in late 1966, are estimated at 5.7 million tons (in terms of ammonium sulphate).

SUDAN. The new $56-million Roseires Dam on the Blue Nile south of Khartoum will provide Sudan with hydroelectric power and irrigation water for 470,000 acres as a start.

CANADA. The Canadian rapeseed industry recently approved establishment of a council to regulate rapeseed marketing. In 1966, Canada produced 25 million bushels of this major oilseed—chiefly for export as edible oil.

MEXICO. The International Agriculture Development Bank has granted a $24.1 million loan to Mexico to finance half the cost of a 100,000-acre irrigation project for vegetables, rice and cotton in northwest Mexico. (*28*)

Like magic, retail food discount stores are popping up all over the country. Close inspection reveals housewives don't mind a restricted selection when the price is right.

Today's consumers can take a look at what tomorrow's food store may be like everytime they set foot inside the grocery department of a discount store.

The conventional supermarket appears to be in no immediate danger of being displaced, but the rapid growth of discount food sales could indicate a trend over the next decade.

Though still few in number, discount food store sales are up 800 per cent since 1960. And trade estimates indicate that in 1966 discounting amounted to 11 per cent of grocery store sales.

Are food prices really lower at a discount store?

Yes, according to a recent comparison of 30 identical items sold in discount stores, conventional supermarkets and independent grocery stores in 10 standard metropolitan areas of the U.S.

Other factors compared in this study (covering the first two months of 1964) included gross margins, labor costs, customer count, average sale per customer and variety of merchandise.

Discounters' gross margins are significantly lower than those of conventional food retailers. Labor costs as a percentage of sales are also significantly lower, though wage rates are little different from conventional stores.

Discount stores generally carry a higher proportion of national brands but the overall choice of food items is smaller.

Average sale per customer is higher in a discount store, parking lots are larger and average customer count is higher.

The most common reactions of conventional food retailers to discounter competition during the period studied included reducing prices and increasing advertising and promotional activity.

Other chain and independent supermarkets variously increased personal service, stayed open longer and gave trading stamps to compete with discounters.

A smaller percentage of independents indicated they felt the price competition than did chain supermarkets.

Most wholesalers said discounting had no effect on their sales volume. But half of those who did notice a change, said the discounters had increased their volume, others indicated a decrease.

What's ahead for discounting?

One indication comes from a leading association of supermarkets. One fourth of all new supermarkets planned by association members last year were of the discount variety. (*29*)

AGGREGATE FARM PRODUCTION AND RETURNS UNDER ALTERNATIVE COTTON PRICES AND ALLOTMENTS, GULF COAST PRAIRIE OF TEXAS. R. E. Hatch and R. H. Rogers, Farm Production Economics Division and D. S. Moore, Texas A&M University. Texas Agri. Expt. Sta. Misc. Pub. 818.

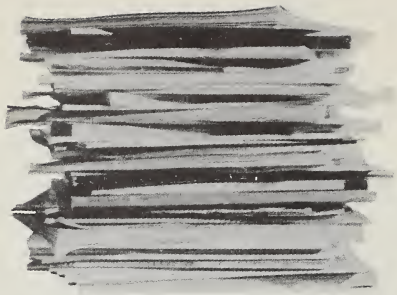
This report appraises the effects of changes in the price of cotton and of specified cotton allotment levels on the estimated aggregate farm production and income in the Gulf Coast area of Texas. Two objectives are outlined. First, to determine the aggregative effects of optimum adjustments under alternative prices for selected commodities on farm production, income and resource requirements with no crop allotments in effect. Second, to extend the analysis to include implications of alternative levels of acreage allotments for specified crops.

THE FARM FOOD MARKETING BILL AND ITS COMPONENTS. H. F. Gale, Marketing Economics Division. AER-105.

The data in this report were developed as part of the U.S. Department of Agriculture's continuing investigation of costs for marketing food. These data will supplement other series published by government agencies in the evaluation of performance in the food marketing sector.

A PROCEDURE FOR PROJECTING YIELDS FOR LINEAR PROGRAMMING OF DRYLAND WHEAT FARMS IN EASTERN COLORADO. H. G. Sitler, Farm Production Economics Division, and K. G. Brengle, Colorado Agricultural Experiment Station. Colo. Agri. Expt. Sta. Scientific Series Paper No. 1102.

This paper outlines the procedure used to project the average county yield of wheat in bushels per acre for 1970 in selected counties of eastern Colorado. The method is based on county averages and associates yields with soils and precipitation zones.



recent publications

The publications listed here are issued by the Economic Research Service and cooperatively by the state universities and colleges. Unless otherwise noted, reports listed here and under Sources *are published by ERS. Single copies are available free from The Farm Index, OMS, U.S. Department of Agriculture, Washington, D.C. 20250. State publications (descriptions below include name of experiment station or university after title) may be obtained only by writing to the issuing agencies of the respective states.*

FURTHER PROCESSING INDUSTRY AND IMPACT OF ECONOMIES OF SCALE IN POULTRY PLANTS. G. B. Rogers, Marketing Economics Division and H. D. Smith, Maryland Agricultural Experiment Station. Md. Agri. Expt. Sta. Misc. Pub. 595.

The extent and nature of the further processing industry and its underlying economic relationships are described in this study. Data were obtained from a survey of the industry and describe the present industry, elaborating on economies of scale within processing plants. The study shows costs, prices and practices of the industry and analyzes economies of scale in single and multiple product operations. Economic impacts of further processing on the poultry industry are evaluated.

AN ANALYSIS OF APPLE-PACKING COSTS IN MICHIGAN. H. F. Carman, Marketing Economics Division, in cooperation with the Michigan Agricultural Experiment Station. MRR No. 786.

The economic-engineering method of cost analysis was used in this study to determine the cost-volume relationships in synthetically constructed apple-packing plants operating under conditions representative of those found in Michigan. Intermediate objectives included the determination of least-cost packing methods and labor requirements for the jobs in apple-packing plants. Cost components considered include dumping, sorting and sizing, packing, container closing, in-plant handling of products and materials, office expense, packaging materials, building costs and supervision and miscellaneous labor, equipment and materials.

ORGANIZING AND OPERATING DRYLAND FARMS IN THE GREAT PLAINS. W. R. Bailey, Farm Production Economics Division, in cooperation with the Agricultural Experiment Stations of Kansas, Montana, Nebraska, North Dakota, Oklahoma and Texas. ERS-301.

This report outlines certain strategies which can help dryland farmers cope with or reduce year-to-year variations in yield and income.

FARMERS' RESPONSES TO THE FEED GRAIN PROGRAM IN THE OHIO CORN BELT AREA. J. R. Tompkin, F. J. Rafeld, Farm Production Economics Division, and D. E. Kimmet, Ohio Agricultural Research and Development Center. Ohio Agri. R&D Ctr. Res. Bul. 991.

The study surveys the effects of Federal feed grain programs in 34 Ohio counties. It had the greatest impact in communities with a high proportion of crop farms and with opportunity for nonfarm employment. The program had less impact in livestock areas.

MINIMUM LAND REQUIREMENTS FOR SPECIFIED INCOMES FOR GENERAL CROP-LIVESTOCK FARMS, SOUTHWEST COASTAL PLAIN AREA, GEORGIA. W. C. McArthur and H. D. Brodnax, Jr., Farm Production Economics Division, and F. B. Saunders, Georgia Agricultural Experiment Station. Ga. Agri. Expt. Sta. Bulletin N.S. 178.

The objectives of this study are to determine the minimum land requirements for a general crop-livestock farm to return specified incomes under alternative cotton allotment-price combinations, and to measure the effects of changes in land prices and wage rates on minimum land requirements.

This analysis should be helpful to farmers considering possible changes in the size of farm business and individuals or groups engaged in developing and administering farm programs.

CHICKENS AND EGGS, 1960-64. Crop Reporting Board, Statistical Reporting Service. Stat. Bul. No. 391.

This publication presents a record of revised estimates relating to hens and pullets of laying age, rate of lay, monthly egg production, and pullets not of laying age.

Current estimates are based primarily on survey returns from farmers and commercial egg producers.

AN EVALUATION OF ALTERNATIVES UNDER THE COTTON PROGRAM OF 1967. F. T. Cooke, Jr., Farm Production Economics Division and T. E. Tramel, Mississippi Agricultural Experiment Station. Miss. Agri. Expt. Sta. AEc. M. R. No. 52.

This study was made for the purpose of determining the most profitable choice of cotton planting patterns for the 1967 crop under the assumption that 35 per cent of the allotment would be diverted. Seventy-five different situations with respect to quality of land and amount of land per acre of cotton allotment to be planted were considered.

RESOURCE REQUIREMENTS, COSTS AND EXPECTED RETURNS; BEEF CATTLE AND IMPROVED PASTURE ALTERNATIVES; EAST CENTRAL AND SOUTH CENTRAL OKLAHOMA. W. Halbrook, Farm Production Economics Division, and K. C. Schneeberger, H. E. Workman and O. L. Walker, Oklahoma Agricultural Experiment Station. Okla. Agri. Expt. Sta. Processed Series P-544.

The data in this publication will be useful to researchers in determining the most profitable level and combination of farm enterprises, given selected, typical farm resource situations in the area. A later publication will report the most profitable whole farm plans.

MARKET POTENTIALS FOR FROZEN DOUGH. N. L. Rollag and R. V. Enochian, Marketing Economics Division. MRR No. 787.

This study analyzes factors that might have an effect on the market potential for frozen unbaked dough by studying trends in production, costs of production and distribution, and acceptance by supermarket managers and consumers.

COSTS AND ECONOMIES OF SCALE IN EGG-TYPE CHICK HATCHERIES. J. R. Pedersen, Marketing Economics Division. MRR No. 782.

The objective of this study is to provide hatchery managers and owners with in-plant efficiency and cost information on egg-type chick hatcheries. Three major areas of study are utilization of incubator capacities, scheduling of work crews and use of labor-saving and cost-reducing equipment.

COMPETITIVE POSITION OF THE MIDWESTERN EGG INDUSTRY. G. B. Rogers, Marketing Economics Division and Herman Bluestone, Economic and Statistical Analysis Division. MRR No. 784.

The basic characteristics of the U.S. egg industry are used as a background for evaluating the current situation of the Midwestern egg industry and its future prospects.

Numbers in parentheses at end of stories refer to sources listed below:

1. Cotton: Supply, Demand, and Farm Resource Use, Southern Cooperative Series 1966, Bul. No. 110 (P*); 2. Poultry and Egg Situation, PES-245 (P); 3. P. S. Andrilenas, T. R. Eichers and A. S. Fox, Pesticides—Farm Expenditures, 1964, AER-106 (P); 4. V. L. Davis, Economic Analysis of Pesticides Used in Agriculture (S); 5. R. N. Van Arsdall (SM); 6. C. C. Boykin and B. R. Eddleman, Economic Aspects of Drylot Feeding on Cattle Ranches in the Southern Plains (S*); 7. D. B. Ibach, Fertilizer Use in the United States, AER-92 (P); 8. Economic Development Division, Farm Population, Series Census-ERS P-27, No. 37 (P); 9. H. A. Johnson and G. C. Taylor, Economic Benefits from Outdoor Recreation Development (S); 10. S. R. Street, Recreation Economics—Fee Fishing in Pennsylvania (M*); 11. H. A. Johnson, Beauty: A New Facet in Resource Management (S); 12. S. H. Stipe and E. C. Pasour, Jr., Economic Opportunities for Selected Recreational Enterprises in the North Carolina Piedmont (M*); 13. R. Bird (SM); 14. B. L. Green, Recreation in the Ozark Region (M*); 15. Farm Production Economics Division (SM); 16. N. L. Le Ray, Working with Low Income People (S); 17. R. W. Gieseman, R. B. Glasgow and E. L. Baum, Approximations of Economic Underemployment for Counties in the Appalachian Region of the United States (M); 18. C. L. Beale, V. J. Banks and G. K. Bowles, Trends and Outlook for Rural Migration (S); 19. E. L. Kreider, An Evaluation of Data Processing Systems for Dairy Farms (M*); 20. P. B. Dwoskin (SM); 21. C. A. Moore, An Economic Evaluation of Starch Use in the Textile Industry, AER-109 (P); 22. Marketing Economics Division (SM); 23. The Western Hemisphere Agricultural Situation, ERS-For. 187 (M); 24. R. M. Walsh and G. Kromer, Food Oils and Fats in World Markets (SM); 25. Foreign Agricultural Trade, April, 1967 (P); 26. Foreign Agricultural Trade, May, 1967 (P); 27. T. A. Warden, U.S. Agricultural Trade with COMECON, For. Agri. Trade, April, 1967 (P); 28. Foreign Regional Analysis Division (SM); 29. M. Leiman, Food Retailing by Discount Houses, MRR No. 785 (P); 30. S. Baker, Shifting Agriculture in Ceylon (M).

Speech (S); published report (P); unpublished manuscript (M); special material (SM); ****State publications may be obtained only by writing to the experiment station or university cited.***

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Agronomical Footnote

Some people call it slash-and-burn. Others call it swidden agriculture. In Ceylon, land rotation goes by the Singhalese word *chena.*

It's a system of shifting cultivation and is used in Ceylon's "dry" zone, where the rainless season may last six months.

In these areas, the center of life is usually a water storage tank with adjoining paddy fields of rice and villagers' homes.

To insure themselves against failure of their rice and to add variety to their diets, the villagers cultivate a *chena*—a forest plot cut over and burnt off toward the end of the dry season to make a clearing for plantings that can mature quickly during the brief rainy season.

Chief tools of *chena* cultivation are a fire, axe, and a hoe-like implement to spread the ashes. Fences to keep out wild elephants, boar and deer are made by piling up large charred branches left after the burn-off.

Seeds of small grains and vegetables are broadcast in a hodgepodge about the time the rainy season is due. The mixtures may include pumpkins and peppers, maize and millets, sesame and sorghum.

Sometimes a *chena* can be used a second year. More often the soil is so impoverished that the cultivator moves on to cut and burn elsewhere.

Ceylon's increasing population is intensifying the *chena* problem and pointing up the necessity for other, more efficient methods of using the *chena*ed areas and finding employment for the cultivators. (*30*)

THE FARM INDEX

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Numbers in parentheses at end of stories refer to sources listed at end of issue.

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